An Introduction to Preprints for the IU School of Nursing

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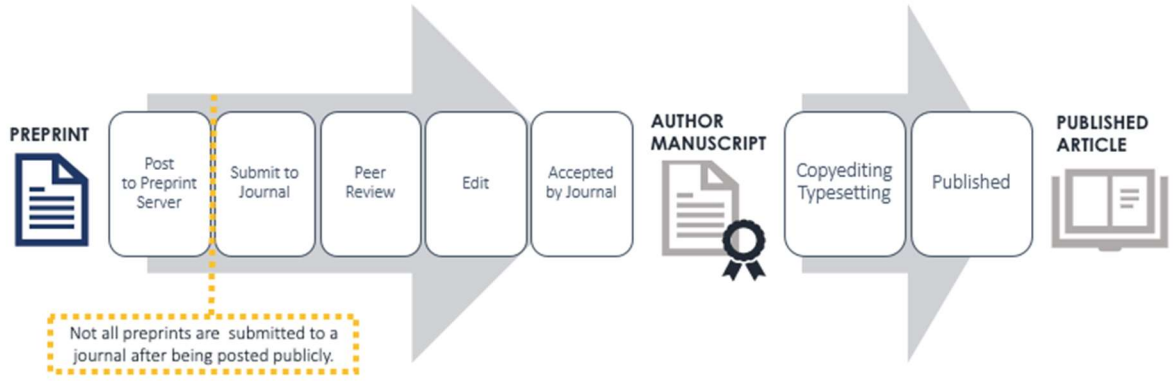
What are preprints?

A preprint is a draft of a scholarly work that predates a peer review process. Most “preprints” (found on preprint servers) have been or will be submitted to journals for peer review, but some will not be. It is also the case that readers can find the preprint version(s) of some articles that have been published in final form in a peer reviewed journal.



(Figure 1. A paper’s lifecycle from preprint to published article. NIH Preprint Pilot. https://www.ncbi.nlm.nih.gov/pmc/about/nihpreprints/)

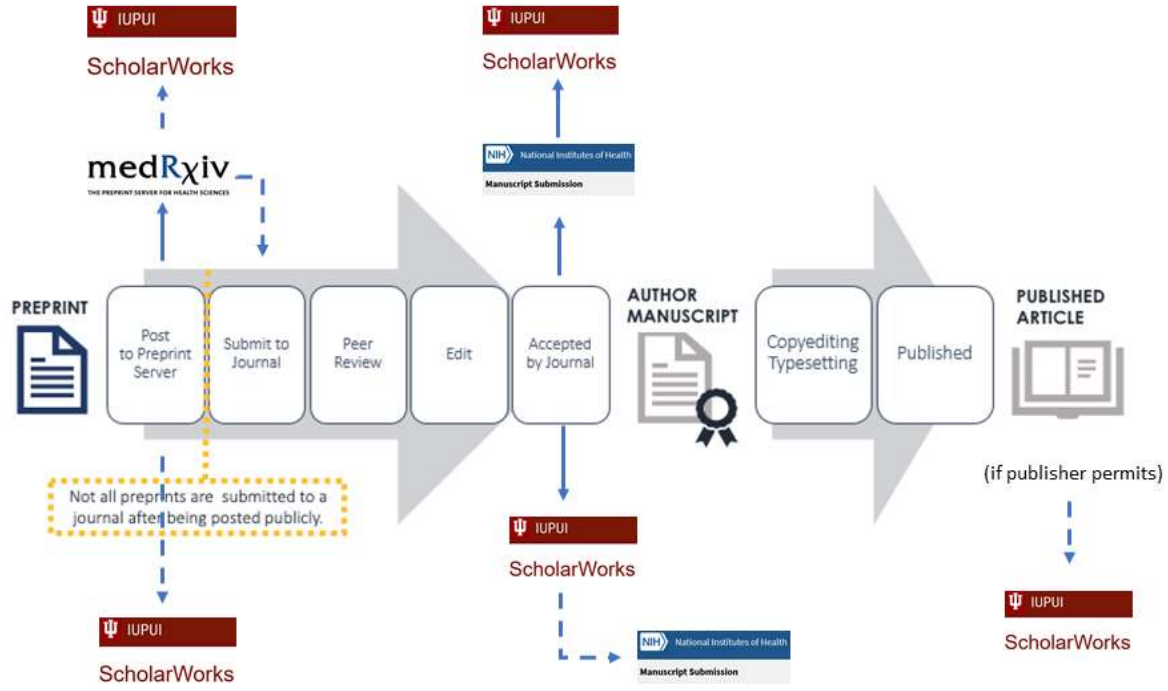
The vocabulary of “preprint”. Many articles are born digital and their readers will never touch a “print” version. As a result, the “preprint - vs - post-print / published” vocabulary can be confusing. Publishers, funders, and libraries also use other terms. Keep in mind that “preprint” can be inclusive of a “submitted version.” Also remember that the NIH Public Access Policy and the IUPUI Open Access Policy rely on the “accepted version.” Sometimes called a “post-print” or an AAM (“author’s accepted manuscript”), the “accepted version” is the final version of the article after the last round of peer review but before the publisher’s type-setting and layout. It

includes the revisions resulting from peer review. In the NIH figure above, this version is called an “Author manuscript.” See, for example:

> Knisely MR, Carpenter JS, Broome ME, Holmes AM, Von Ah D, Skaar T, Draucker CB. Medication Exposure Patterns in Primary Care Patients Prescribed Pharmacogenetically Actionable Opioids. *Qual Rep*. 2018 Aug;23(8):1861-1875. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6660172/

Preprint sharing usually happens before publication, but while sharing the “accepted manuscript” can happen prior to publication, most “author manuscripts” on PubMed Central wait for a publisher-required, 12 month embargo to expire.

Preprint’s ***do not*** meet the requirements of the NIH Public Access policy (https://www.nihms.nih.gov/), but they ***do*** help to increase your readership. To meet the requirements of the NIH Public Access policy, you may need to upload your “author manuscript” to the NIHMS. Alternatively, if you participate in the IUPUI Open Access Policy (https://openaccess.iupui.edu/), the library will make the NIHMS deposit on your behalf and also archive the manuscript on IUPUI ScholarWorks: https://scholarworks.iupui.edu/.



(Figure 2. How IUPUI ScholarWorks supports preprints and the NIH Public Access Policy.)

Where did all these preprint servers come from?

Preprint sharing is an established practice in many disciplines. In the health sciences, the then director of the NIH, Harold Varmus, proposed a preprint server for biomedical sciences in May 1999. The proposal for “E-Biomed” included the support of David J. Lipman (Director of NCBI), Patrick O. Brown (co-founder of PLOS), and (among others) Anthony Fauci

(https://profiles.nlm.nih.gov/spotlight/mv/catalog/nlm:nlmuid-101584926X356-doc). E-Biomed was supported by authors and librarians, but opposed by publishers. Following intense lobbying, the idea of preprint sharing was scrapped and replaced by a 12-month embargo, post-print sharing approach on PubMed Central (https://scholarworks.iu.edu/dspace/handle/2022/170).

Preprint servers have a long history in other fields. For Physics, Mathematics, Computer Science and other quantitative fields, arXiv.org began in 1991. For Law and other social sciences, SSRN launched in 1994. Two decades later (2013), bioRxiv launched at Cold Spring Harbor Laboratory. The launch of bioRxiv was preceded by non-field specific services (like Zenodo, 2011) and followed by the launch of a long list of preprint servers for nearly every field and discipline. By 2019, a total of 44 preprint servers were available with a "biomedical or medical scope" (http://dx.doi.org/10.1136/bmjopen-2020-041849).

Even before COVID-19, preprint sharing in biomedical research was on the rise--the 2017 NIH guidance (NOT-OD-17-050) encouraging "investigators to use interim research products, such as preprints, to speed the dissemination and enhance the rigor of their work" may have been a key factor in this increase (https://grants.nih.gov/grants/guide/notice-files/NOT-OD-17-050.html).

By 2020, roughly 6% of all articles have been previously shared as a preprint--with some fields (e.g., Physics) surpassing 30%.

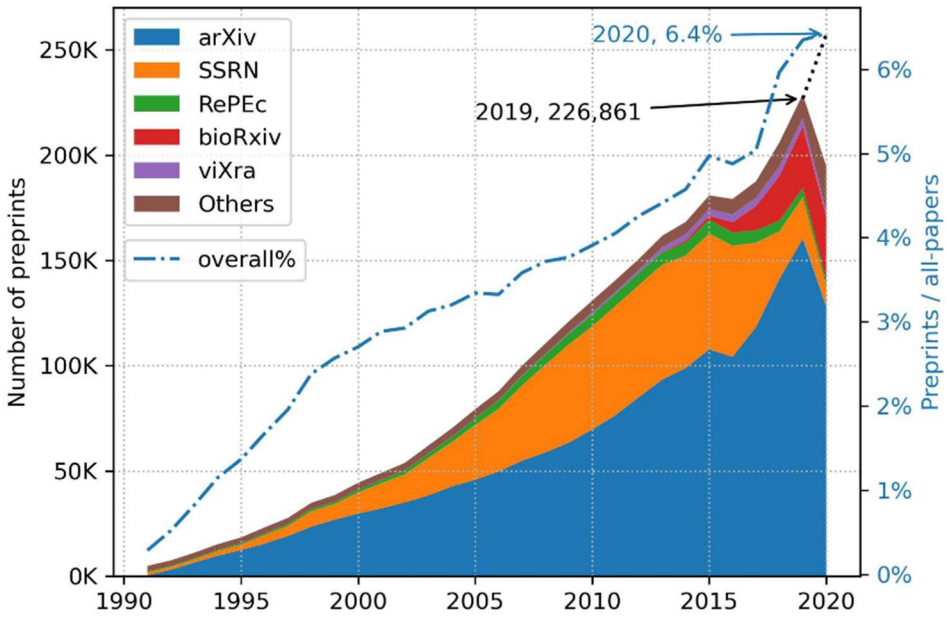


Figure 3. Annual number of preprints (P-all) and reprints(P-all)/all-papers(P-all+JC-all) rate growth (Xie, B., Shen, Z., & Wang, K. (2021). Is preprint the future of science? A thirty year journey of online preprint services. http://arxiv.org/abs/2102.09066).

Preprint sharing in the biomedical sciences is less common, but growing very quickly!

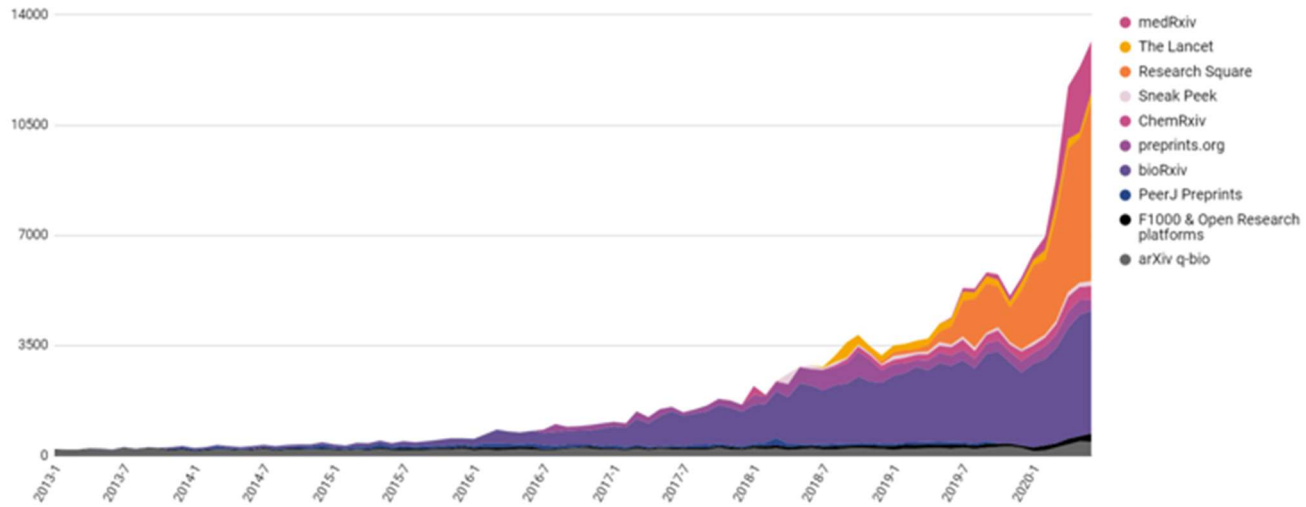


Figure 4. Biomedical preprints per month through 2020-06 (Polka, J. K., & Penfold, N. C. (2020). *Biomedical preprints per month, by source and as a fraction of total literature* [Data set]. Zenodo. https://doi.org/10.5281/zenodo.3955154).

The rapid growth of preprint sharing has caught some researchers by surprise. At IUPUI we have watched IU researchers on Twitter denounce the growth of preprint sharing in the spring of 2020 and then post their first preprint to medRxiv in the following year. IUPUI authors are not alone--we are all adjusting to rapid change in how we do our work. With regard to preprint sharing, from January 2020 to October 2020 the overwhelming majority of preprints were posted as the author's first submission to a preprint server--that includes 85% of all COVID-19 related preprints and 69% of all non-COVID-19 related health science preprints during this time period (https://doi.org/10.1371/journal.pbio.3000959). The rate of growth in preprint sharing in the health sciences may slow a bit when the pandemic subsides, but we expect that first-time authors will likely return with additional submissions. Furthermore, as long as the NIH and other funders accept preprint citations in grant applications and reports, preprint sharing will be a useful dissemination strategy for many authors.

Where would authors in Nursing share preprints in biomedical research?

For preprints in Nursing, we recommend medRxiv (https://www.medrxiv.org/). MedRxiv was launched in 2019 for the health sciences. It uses the same software as bioRxiv and is the result of a non-profit collaboration between Cold Spring Harbor Laboratory, BMJ (British Medical Journal, British Medical Association), and Yale University. Note, however, that medRxiv screens submissions and will not accept work that has already been submitted to a journal. MedRxiv also does not take review articles. Consult the medRxiv FAQs before submitting your preprint: https://www.medrxiv.org/about/FAQ. The advantages of using medRxiv includes a growing list of journals that will route a preprint as the initial submission (a "direct transfer") to the journal.

If medRxiv does not work for your article, other options are available. Several publishers now host preprint servers--including Springer-supported *Research Square* and MDPI-owned *Preprints.org*, but you may prefer to use a non-profit, preprint service. If medRxiv does not work for your preprint, we recommend using Zenodo (tip: create your account with ORCID) or IUPUI ScholarWorks.

Zenodo is supported by the European Union, but open to all: https://zenodo.org/.

IUPUI ScholarWorks currently does not have some of the features of Zenodo (e.g., versioning), but you will get better customer service: https://scholarworks.iupui.edu/.

Why do authors share preprints?

The benefits to preprint sharing are numerous, but a few of the biggest opportunities are the potential for early readership, pre-peer review feedback, and “staking a claim” on a given topic. In many instances, your preprint becomes a permanent part of the scientific record as soon as it’s posted, and it becomes citable with its own unique DOI. Because posting preprints allows you to publicly date stamp your research, you don’t need to worry about being “scooped" or being beholden to the typically slow pace of traditional journal publishing. Preprint servers also enable you to showcase your latest work for grant, hiring, or tenure committees in a more concrete way, rather than the traditional method of marking an item as “in development” on your CV. Other more altruistic benefits of publishing preprints include increasing the speed of research communication and giving others an opportunity to read research for free.

How to share a preprint?

If you intend to publish your work as an article at some point in the future, we recommend that you review the individual publishing guidelines for the potential journal(s) before posting a preprint. According to an editorial in the *Journal of the American Medical Association* (10.1001/jama.2020.20674), a recent study of 100 top-ranked clinical journals found that 86% of journals allowed preprints and 13% had a case-by-case assessment policy. You can also check Sherpa Romeo, an online resource that aggregates and presents publisher and journal open access policies from around the world: https://v2.sherpa.ac.uk/romeo/search.html.

Other best practices include checking with your co-authors prior to posting a pre-print, and being generally confident in your methods to ensure you are sharing good research to the best of your ability. Sites such as ResearchGate or Academia.edu are not preprint servers, and should not be used as such.

If I see a preprint that is relevant to my research, how do I cite it?

The short answer is that you should cite a preprint just like you would anything else, but here are some suggestions to ensure you are doing your due diligence. First, check to see if the

preprint has resulted in a peer-reviewed publication, and if it has, you can cite that instead. As with any work (but especially in this case), make sure you read the preprint thoroughly before citing it, and review any online discussions of the work. The online comments may bring to light concerns with the methods or results of the research, or it may give you additional ideas to consider when citing it. As you cite preprints, we encourage you to refer to the work as a "preprint" when writing about it as a note to readers that the work has not been peer reviewed (but is still valuable.) Additionally, you should always cite with reference to the preprint server and include a persistent identifier (typically a DOI). An example of a preprint citation for the APA 7th edition style guide can be found below:

Hampton, S., Rabagliati, H., Sorace, A., & Fletcher-Watson, S. (2017). *Autism and bilingualism: A qualitative interview study of parents' perspectives and experiences*. PsyArXiv. https://doi.org/10.31234/osf.io/76xfs

Where can I learn more about preprints and preprint sharing?

IUPUI University Library maintains a guide to preprints for all fields and disciplines on the library's website for subject guides: https://iupui.libguides.com/preprints.